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Raw Products Research Activities

Progress Made in Indiana Studies of Tomatoes and Sweet Corn for Canning

The Fifty-third annual report of the Purdue University Agricultural Experiment Station at Lafayette, Ind., records progress of particular interest to canners in studies relating to sweet corn and tomatoes.

SWEET CORN

Chemical studies of the quality of inbred lines of sweet corn have been in progress for several years and in general the results during the past year agree closely with those previously obtained. In all the lines studied sugar is lost when the green sweet corn is stored at 68° F. This sugar-loss is accompanied by an increase in total polysaccharides. The extent of these changes depends upon the genetic constitution of the corn. Of the 26 lines studied in 1938, four Golden Bantam lines, two Country Gentleman lines and one Evergreen line are definitely superior to other lines from the standpoint of ability to maintain their sugar content during storage.

Seed of the inbred lines for the production of a new sweet corn single-cross hybrid No. 1406 has been released to seed production agencies. This hybrid has the parentage 39C x P.14. The new hybrid has excelled both in yielding ability and high cutting percentage. The cutting percentage has ranged from 37 to 40 per cent, compared with 25 per cent for Golden Cross Bantam, while the yield has exceeded that of Golden Cross Bantam. A second hybrid, No. 31A (268 x P.51), has been superior in yield and quality to 14 other hybrids with which it has been compared. It will be studied further before a decision for release is made.

Several experimental double crosses of the Country Gentleman type were more productive than the open-pollinated and hybrid strains with which they were compared. Double crosses are especially desirable in Country Gentleman hybrids because of the size and quality of seed, which permit uniform planting and vigorous germination. Golden Sunshine No. 28—a medium-early, wilt-resistant inbred—produced hybrids of excellent yield and good quality for the market garden trade.

Rapid spread and increase in population of the European corn borer has occurred in many localities of the State. The development of a second generation in Indiana has shown some indications of altering the situation beyond that which was predicted several years ago, and this complicates the recommendations on date of planting as a control measure. Studies on the resistance and tolerance of 28 hybrids conducted at Auburn, showed, in general, that hybrid strains are more resistant than open-pollinated varieties. However, not

all hybrids are equal in this respect. The R4 inbred strains continued to display a relatively high degree of resistance.

Electric traps as a possible control for European corn borer again were used, and when set in one field of dent corn and another of sweet corn, borer population was greatly reduced in comparison with unlighted fields in the locality.

DISEASES FOUND IN DIRECT-SEEDED TOMATO PLANTS

From three years' observation on plants raised by direct-seeding contrasted with the use of transplants, it has been concluded that there is no important difference between them in the amount of infection from the three most important diseases occurring in Indiana—Septoria leafspot, *Macrosporium* leafspot, and anthracnose.

Collar rot and bacterial spot, two diseases often found on out-of-State plants, rarely have been found in direct-seeded fields. Collar rot, when found, usually has occurred in fields that previously had been cropped to tomatoes and where the plants had not been thinned early enough. Only a few plants infected with bacterial spot have been observed in direct-seeded fields, whereas this disease has been very common in those set with out-of-State plants, although it was not found in 1940 on any plants in Georgia nor was any noted on the plants when they arrived.

Tomato mosaic is most commonly found in fields set with greenhouse-grown transplants. Out-of-State, home-grown, and direct-seeded plants are usually free of this virus until it is introduced into the field from some source other than the plants originally set.

Plants infected with bacterial wilt and southern root rot have never been observed in direct-seeded fields or those set with home-grown plants. The appearance of these two diseases in Indiana has always been traced to out-of-State plants.

SOURCE OF BACTERIAL SPOT INFECTION ON TOMATOES

Bacterial spot has been appearing in recent fields of canning tomatoes in Indiana in spite of seed treatment which frees the seed of the bacteria that cause the disease. The disease was found in over 80 per cent of the fields set with out-of-State plants in 1938, 1939 and 1940. Infection varied from 10 to 100 per cent in these fields when observed during the last of June. Usually infection had spread over the entire field by the middle of July. With few exceptions, fields set with home-grown plants or direct-seeded were free of infected plants. When infected plants were found in the latter fields the reason was evident. Often the land had been previously cropped to tomatoes, or untreated seed used.

Most of the Indiana tomato acreage is set with certified plants raised in the southern States. Such plants are

produced from Indiana certified seed which is carefully treated to free the seed of the bacterial spot organism and sown on land carefully selected for crop history. No bacterial spot was found in 1940 in fields of plants in Georgia destined for Indiana canners nor on the plants upon arrival in Indiana. Yet four weeks later bacterial spot was common in Indiana on all lots of plants observed from southern States. Similar certified seed was used for the production of locally grown plants and in direct-seeding. Plants raised from these sources were free of infection. Present evidence would indicate that bacterial spot occurred extensively on out-of-State plants, but there is no satisfactory explanation of the source of the infection since none was found in the plant beds examined in Georgia nor upon certified plants upon arrival in Indiana.

TOMATO DEFOLIATION

Defoliation of tomato plants under Indiana conditions seems to coincide with the period of heavy draft of the fruit on plant food resources, at which time the plants become progressively less vegetative. This defoliation reduces the productivity of the plants and exposes the fruit to the sun, resulting in lowered yields and poor quality of fruit. It has been noted, on the other hand, that sterile or fruitless plants and young plants, both of which are in a highly vegetative condition, are less predisposed to defoliation. It is not certain how these observations apply to either one or both of the two principal defoliation diseases, caused by *Septoria leafspot* and *Macrosporium leafspot*.

An experiment was carried out in 1939 wherein defoliation, caused principally by *Septoria leafspot*, was measured in nine series of outdoor plots of tomatoes. Each of these series of plots received a different treatment, designed to influence the carbon-nitrogen balance in the plants. One series of plots received no fertilizer, but all blossoms were removed from the plants. A second series, also unfertilized, was set out a month late, while a third series of unfertilized plots served as the check. Five of the other six series of plots were fertilized at time of setting with N, NP, NK, PK, and NPK, respectively, while the remaining series received an application of nitrogen alone a month after setting.

The plants from which all blossoms were removed grew to large size, while those set late were naturally smaller than any others and bore less fruit. No obvious differences in growth or fruiting could be noticed among any of the other treatments. Extensive defoliation, due primarily to infection by *Septoria leafspot*, developed throughout all plots and apparently reached a maximum the last week in August, at which time final measurements were taken.

Defoliation was significantly less severe in proportion to size of plant on the highly vegetative, deflorated and younger plants, the large, non-fruiting plants being defoliated approximately 47 per cent and the late-set plants 58 per cent. Defoliation was significantly more severe in proportion to size of plants in all of the other series of plots and amounted to approximately 75 per cent. Slight differences in extent of defoliation occurred among the unfertilized check and variously fertilized series of plots but these differences were not great enough to be significant.

The results of this experiment are in line with the general field observation that the vegetative, non-fruiting and young plants are defoliated less than the non-vegetative heavily

fruiting plants. More detailed studies on this problem are under way.

BREEDING TOMATOES FOR DISEASE RESISTANCE

This program includes breeding for resistance to *Fusarium wilt*, *Septoria leafspot* and *Macrosporium leafspot*.

A backcross program to incorporate into the Baltimore and Rutgers varieties resistance to *Fusarium wilt* from a wilt-immune strain of *L. pimpinellifolium* is in the fourth and fifth backcross generation. The wilt immunity of this strain was discovered by the Missouri Agricultural Experiment Station. Fruit size of the hybrids is now satisfactory, and field selections of plants with desirable fruit and vine habit will be made. Several foreign introductions by the U. S. Department of Agriculture have been found to be highly wilt-resistant. There is evidence that at least one such accession has a different basis for resistance than does *L. pimpinellifolium*. Approximately 30 of 250 of these introductions tested with *Septoria leafspot* and *Macrosporium leafspot* have proved to have some resistance for either one or for both of these diseases. Further work is being done to obtain as many crosses as possible with the accessions showing any degree of resistance to these diseases.

TOMATO QUALITY STUDIES

In one of two fertilizer tests on light-colored silt loam soils, no response was obtained to nitrogen, phosphorus, or potassium. In the other test there was an indicated response to a small quantity of potash (40 pounds actual potash per acre) but the yield difference in favor of the fertilized plots was not significant.

Weak glycerine solutions used in the packing material around the roots of shipped tomato plants failed to improve yields of the plants when they were grown in the field. Transplanted plants outyielded plants grown from seed sown directly in the field.

TOMATO SEED PRODUCTION

Forty-five varieties and strains of tomatoes, including Rutgers, Marglobe and the new Illinois wilt-resistant varieties, were compared for yield and plant characteristics. None were found that yielded as well as the Indiana Baltimore under conditions in Indiana and notes on plant characteristics show that several of them do not produce sufficient foliage to cover the fruit well, which results in much sun-scalding.

A one-year's trial to compare yielding ability of seed saved late in the season with that saved early showed an increase in yield in favor of the late-saved seed.

Reference: Fifty-third Annual Report, Purdue University Agricultural Experiment Station, Lafayette, Ind.

Manual of Pear Growing in California

The scope of a recent publication issued by the California Agricultural Extension is indicated by its title—"Pear Growing in California." It is a comprehensive manual of 87 pages, discussing all phases of pear growing such as variety selection (including variety descriptions), rootstocks, orchard care, pollination, diseases, insect pests and their control, and harvesting and handling of Bartlett pears.

Reference: Circ. 122, "Pear Growing in California," California Agricultural Extension Service, Berkeley.

Texas Experimental Work Supplemented by Field Laboratories and Substations

The Texas Agricultural Experiment Station is the organized agricultural research agency of the State of Texas. It is one of the major divisions of the Agricultural and Mechanical College of Texas. Its work at the Main Station is supplemented by work in field areas at seventeen substations and ten field laboratories.

The following excerpts from the latest report of this Station indicate the progress of work on certain crops grown for canning. The research here noted was carried on at Weslaco, where the agriculture is of a highly intensified type, at Substation No. 19, at Winter Haven, which is in the center of a large area specializing in the production of vegetables with irrigation, and at the Tomato Disease Laboratory at Jacksonville.

CITRUS EXPERIMENTS

Soil management studies conducted at the Weslaco Station indicate that orchard cultivation should be reduced to the minimum, that nitrogen concentrates are most beneficial in increasing citrus fruit production and tree growth, and that proper timing of irrigation is highly important in obtaining a good set of fruit and in sizing up the crop.

TOMATO VARIETIES

The Weslaco Station reports that nine varieties of tomatoes were grown near Harlingen and near Brownsville. A January freeze destroyed the first plantings and continued cold weather interfered with the normal development of the second planting. Stokesdale, Pearson, and Valiant set more fruit under the adverse weather conditions than the other varieties, while Marglobe and Pritchard were most adversely affected. Rutgers and Stokesdale were the two most desirable varieties for market. Valiant and Pearson are newer sorts which show promise for this section.

TOMATO TRANSPLANTING STUDIES

In an effort to obtain early fruiting of transplanted tomato plants, 16 different treatments were applied at the Weslaco Station to the plants used in these tests. In most cases, transplanting solutions of various kinds were applied about the roots at the time the plants were set in the field, but in some cases the materials were applied in holes about the roots of field-seeded plants. Some of the treatments gave slight increases in yield of early fruit, but the most outstanding results were derived from a form of girdling that apparently brought about a favorable nitrogen:carbohydrate balance for fruit setting.

LIMA BEAN VARIETIES

Henderson's Bush, Baby Potato lima, and Baby Fordhook lima produced high yields of small tender beans at the Weslaco Station.

BUSH AND POLE SNAP BEANS

Six varieties of bush snap beans and three varieties of pole snap beans were grown during the fall of 1940 at the Weslaco Station. Plentiful, Tendergreen, and Full Measure matured two weeks before the other sorts. The Blue Lake pole varieties are promising both from the standpoint of

quality and yield. There was little difference in the quality or yield of the bush varieties studied.

SWEET CORN HYBRID ADAPTABILITY TEST

Sixteen Texas hybrid sweet corns were tested in comparison with Ioana, a commercial hybrid sort. Ioana is a cross between Purdue 39 and Iowa 45. Each of the 16 Texas hybrids also had Iowa 45 as one of its parents. Of the 16 lots, three were equally as good as Ioana in quality and produced more than double the yield of Ioana. The main reason for these yield-differences was due to corn earworm damage. All ears damaged beyond the tip were considered unmarketable in this test. On the basis of this classification, approximately 50 per cent of the Ioana ears were discarded whereas only 10 to 17 per cent of the ears of the three Texas hybrids were unmarketable.

CABBAGE AND TOMATO STUDIES AT WESLACO

Other work at the Weslaco Station includes cabbage variety and fertilizer tests, studies of black rot, and control of cabbage worms. Derris-sulphur (10-90) gave best control of cabbage looper and diamond back. Tomato variety and fertilizer tests and tomato fruiting studies are also reported from Weslaco.

BREEDING SPINACH FOR DISEASE RESISTANCE

At the Winter Haven Station, work has been continued on the control of the three most important diseases of spinach in this area, namely, downy mildew or blue mold, curly top, and white rust. Emphasis has been placed on the development of disease-resistant varieties but fungicidal treatments also were tried.

Selections for resistance to downy mildew made two years ago have been carried through another season. Some of the progeny plants are in good growing condition and have shown relatively little damage from downy mildew in comparison to the check plants.

Selections for resistance to white rust are being made from a wide area of commercially grown spinach which has been badly hit by this disease. It is becoming more and more apparent that white rust may prove to be the most devastating disease on spinach in the Winter Garden area and may seriously threaten the existence of the industry there. Every advantage is being taken of the epidemic (1940-41) in order to discover disease-resistant plants.

RESISTANCE OF TOMATO VARIETIES TO FUSARIUM WILT

Studies made at the Tomato Disease Laboratory at Jacksonville indicated that valuable wilt resistance was found in Glovel, Morse 113-6, Stokesdale, and John Baer (resistant strain) tomatoes in addition to those previously reported. Bison and North Dakota "40" varieties are dwarf types very susceptible to wilt.

EFFECT OF WILT RESISTANCE ON TOMATO YIELDS

Even in an epidemic of Fusarium wilt, marketable yields of six to seven tons of fruit were harvested from Break O'Day, Illinois Baltimore, Marglobe, Michigan State, Pritchard, Rutgers, and "white-flowered" tomatoes which are wilt-resistant. In contrast, Bonny Best yielded only 0.5 ton, and Stone yielded only one ton of marketable fruit per acre in representing wilt-susceptible varieties.

RESISTANCE TO BLOSSOM-END ROT

A randomized yield test of tomato varieties was conducted practically without complication from wilt. Marglobe and Pritchard varieties gave the best yields, producing more than eight tons of marketable fruit per acre. Pritchard, Marglobe, and "white-flowered" tomatoes were strongly resistant to blossom-end rot. Grothens Red Globe, Gulf States Market, Illinois Baltimore, and Rutgers were seriously susceptible, while Louisiana Red and Buckeye State were extremely susceptible to blossom-end rot. An unusual symptom of blossom-end rot appeared in wet weather when many tomatoes showed uneven fruit surfaces with brown areas indicating internal brown tissues.

TOMATO SPRAYING

Summary data from the last three rainy seasons show that early blight and bacterial nail-head rust were greatly delayed in appearance and caused little damage to tomatoes sprayed with Basicop, Copper Hydro 40, or Z-O. Such tomatoes gave average yields 10 to 13 per cent larger than the yields of the unsprayed check rows. These new chemicals merit recommendation for commercial use in East Texas. They cost less than Bordeaux mixture and are less injurious to tomatoes in dry weather.

Reference: Fifty-third Annual Report of the Texas Agricultural Experiment Station, College Station.

Wisconsin Sweet Corn Canning Trials—1941

Sweet corn canning trials of 11 hybrids involving seven Golden and four Country Gentleman strains were conducted in 1941 by the Wisconsin College of Agriculture. All strains were packed in whole kernel style and graded by a committee of eight experienced canners.

A yield trial of six experimental Golden Hybrid strains obtained from out-of-State sources was also made. The purpose of this trial was to evaluate the relative performance as regards agronomic characters.

The trials were planted near Columbus, Wisconsin, on May 12 and 14. By and large, the Golden Bantam trials were quite satisfactory so far as yield is concerned. However, the problem of obtaining really dependable and satisfactory strains of Country Gentleman hybrids for Wisconsin has not yet been solved. The results of this test showed that available strains which give satisfaction in the Corn Belt apparently are not fully adapted to Wisconsin conditions under which they give erratic performance records. It is therefore deemed advisable to give only a restricted recommendation to Country Gentleman strains currently available and canners are urged to use caution in this regard.

Newer hybrid strains tested in 1941 included Sachem, Hiawatha, and Aristogold No. 1 and No. 2.

The mimeographed report recently released describes the sweet corn variety trials, summarizes the performance of hybrids tested for two or more years, comments on new hybrids, and includes data on yield, source of seed and names of breeders.

Reference: Wisconsin Sweet Corn Canning Trials. Mimeographed report, Wisconsin Agricultural Experiment Station, Madison. Copies available to members on request to Raw Products Bureau.

Wide Influence of Plant Breeding Work Carried on at Connecticut Experiment Station

Although Connecticut is not one of the leading states in canning crop acreage, the agricultural research conducted by the Connecticut Experiment Station has had an influence on agricultural progress to an extent far beyond the size or agricultural resources of the State. Canners in many sections have benefited directly or indirectly from its outstanding work on plant breeding, especially that relating to sweet corn improvement.

The following excerpts illustrate, in part, the research in progress in Connecticut that may have application to canning crops in other states.

SWEET CORN BREEDING

A recent survey of the hybrid sweet corn seed produced for sale in the United States in 1941 shows that one-half million pounds is of Connecticut hybrids or of mixed Connecticut and outside parentage. This is approximately enough to plant one-tenth of the sweet corn acreage in the country. It is the aim of station plant breeders to develop a productive hybrid for each of the seven different sweet corn seasons: Very early, early, early midseason, midseason, late midseason, late and very late. There is a difference of about three days between each of these.

In 1940 trials, Spancross, Marcross and Carmelcross were the best in their respective seasons. They were tested not only in Connecticut but rather generally in the corn-growing areas of the United States. All three are resistant to bacterial wilt. Spancross, a very early sweet corn, is the first to produce an ear of suitable size for market. It should be planted in the earliest soil and be well fertilized to make its best growth. Marcross, an early variety, is picked about three days later. It produces a very large ear, one that will compete with most of the midseason varieties. The quality is good. Carmelcross follows Marcross after a three-day interval. It is classed as early midseason in maturity, producing a rather long, slender ear of excellent quality. These three hybrids provide a succession of sweet corn up to midseason.

A new midseason sweet corn has been developed, thoroughly tested, and will be produced commercially in 1941. This is a cross between Connecticut 23, a Whipple inbred, and Purdue 39. The hybrid matures about three days before Golden Cross Bantam. Several new late varieties are being tested and seed of some of these will be produced commercially in the near future.

EUROPEAN CORN BORER

On the basis of plot experiments reported previously, a large-scale field experiment for control of the European corn borer in early sweet corn was conducted in 1940 on two plots in New Haven, using on one plot a derris dust containing 1 per cent rotenone and on the other a dual-fixed nicotine dust containing 3.75 per cent nicotine. The ears from the derris plot were 50 per cent borer-free, and the untreated plot produced 28 per cent borer-free ears. In spite of the lower cost of derris dust, dual-fixed nicotine was preferred because of the high percentage of borer-free ears.

In experimental plots, the effect of different insecticides and the time and method of application were investigated.

These tests confirmed the greater effectiveness of dual-fixed nicotine as compared to derris dust.

CABBAGE MAGGOT

Experiments using calomel-gypsum dust for control of cabbage maggot showed that an application of 4 per cent calomel dust (with clay, talc, or gypsum as a carrier), made around the stems of newly-set cabbage plants in April, protected them from cabbage maggots. The advantages of this method are (1) that the insecticide is applied before the eggs are deposited and timing is no longer a problem, and (2) that the treatment can be completed at planting time, thus avoiding further work later.

SQUASH BREEDING

The first generation hybrid between Connecticut inbred C10 and Early Prolific Straightneck has been named Yankee Hybrid. A discovery in connection with breeding this plant is that it appears that the second generation hybrid yields as many early and marketable fruits as the first. While seed of the first cross may be expensive to produce, that of the second generation comes at small cost. Two seedsmen have produced this hybrid on a commercial scale and their satisfactory reports indicate that the market production of Yankee Hybrid is possible.

TOMATO DEFOLIATION STUDIES

In 1940 the defoliation disease of tomatoes caused by *Alternaria solani* developed more rapidly and became more destructive than it had been during the past 10 years. A note published in the *Plant Disease Reporter* suggested that its rapid development may have been associated with the leaching of fertility from the soil by the early summer rains, so that the plants became more susceptible to *Alternaria* attack. Field plot trials indicated that susceptibility to *Alternaria* was increased by side dressing of nitrate of soda and by defruiting the plants. If these findings are true they show that susceptibility may well be related to the carbohydrate-nitrogen ratio within the foliage. It is stated as one of the results of research on fungicides that disease-control depends upon the amount of spray applied per acre rather than on the concentration, which means that the control obtained by a low amount of copper can be increased by applying it in a larger quantity of water.

NEW ORGANIC FUNGICIDES

This station is one of the few in the United States which has embarked upon a research program in new organic fungicides. One material developed here is now on the market. It exerts a striking protective action on lima bean seed and apparently stimulates the growth of the plant. Formerly lima bean seed could not be treated safely with any fungicide.

COLOR AND SWEETNESS OF BEETS

For several years the station has been investigating the causes of variation in color and sweetness of beets. Selection for high quality, high pigment and sugar content within inbred lines is being continued as well as studies on the influence of environment, season, soil, nutrition, and storage on these characteristics.

The common belief that beets grown in different seasons and soils have different amounts of pigment has been sub-

stantiated by experimentation. The differences have been measured numerically and tabulated and several facts have been noted: (1) The pigment content of roots may vary as much as 100 per cent between two consecutive years or 50 per cent between spring and fall. (2) The pigment content can be appreciably changed within the same strain by growing the plants in different nutrient solutions. (3) Different soil types may be responsible for color differences. (4) The pigment in stored beets is lost rapidly during the first two weeks of storage.

Reference: Bulletin 446, Annual Report of the Connecticut Agricultural Experiment Station for the year ending October 31, 1940, New Haven.

New Insect Control Bulletin from New York State

A new bulletin containing information on control of a number of insects attacking crops grown in New York State recently has been published, making available the results of current work of timely interest to the growers and canners of New York and to scientific workers generally. Included are data on the present status of the mineral oil treatment for corn ear worm control; the use of concentrated sprays for pea aphid control; use of rotenone dust, nicotine sulfate spray, and derris spray for squash vine borer and striped cucumber beetle; use of dual-fixed nicotine dust and one per cent rotenone dust for European corn borer control; control of cherry fruitflies with rotenone-bearing materials and phenothiazine, and the use of rotenone-bearing materials for the control of cabbage worms.

Reference: Bulletin 698, Current Contributions on Insect Control. N. Y. State Agricultural Experiment Station, Geneva. Copies available to members on request to the Raw Products Bureau.

New Jersey Tomato Seed Certification

The New Jersey Department of Agriculture, reporting recently on tomato seed certification for 1941, shows 4,287 acres of tomatoes certified of which Rutgers comprised 2,547 acres and Marglobe 1,246. A total of 126,421 pounds of seed were certified, the principal varieties and amounts of seed of each being as follows: Rutgers, 69,191; Marglobe, 38,485; and Stokesdale, 17,070 pounds. The report shows the acreage and number of pounds certified for each of six seedsmen and includes a table of varietal distribution of tomato seed acreages certified by years for 1921-1941, inclusive.

Reference: "Tomato Seed Certification Report for the Year 1941." New Jersey Department of Agriculture.

Testing Soil Deficiencies

The primary problem in most soil testing is not that of the capacity of the chemist to find weak spots in the laboratory samples, but the capacity of the owner of the land to select a sample that is representative of the field, plot, or spot in question. Soil differs greatly, not only from region to region, and from field to field, but from spot to spot in the same field. How to choose a soil sample for laboratory examination, and what fertilizers must be applied to make up deficiencies, is described in a recent publication.

Reference: Circ. 417, "Testing Soils for Deficiencies," New Jersey Agricultural Experiment Station, New Brunswick.

Report on 1941 Pea Seed Treatment

A recently issued report on pea seed treatment contains results from a series of tests in 1941 in which some 30 States and Canadian provinces took part. Cannors considering pea seed treatment will be interested in the following summary or comment on the report by Dr. J. C. Walker, Department of Plant Pathology, University of Wisconsin:

Inasmuch as we have no results at the college as yet whereby seed treatment and seed inoculum can be applied without injury to the latter, these results are of particular value to those who do not use inoculum.

It is to be noted that they are concerned with Alaska, Wisconsin Early Sweet and Thomas Laxton. We secured similar results in our Wisconsin tests with Perfection, Prince of Wales, and Penin.

These data seem to warrant the following general conclusions:

- (1) Alaskas do not respond to any treatment and should not be treated.
- (2) In many tests Sweets show improved stands following treatment.
- (3) Many other factors cause reduced stands which are not corrected by seed treatment.
- (4) In our Wisconsin experience treatment is most valuable in the early plantings of Sweets.
- (5) Of the four materials used Red Copper Oxide and Spergon are the best considering costs and effectiveness. Of these two, Red Copper Oxide at present prices will cost about six cents per bushel. Spergon will cost between 15 and 20 cents per bushel. In the overall average with Wisconsin Early Sweets, Spergon improved the stand by 21 per cent, Red Copper Oxide by 13 per cent.

Reference: Pea Seed Treatment, 1941: Report by Dr. H. T. Cook, Virginia Truck Experiment Station, Norfolk, Va., for Committee on Coordination in Seed Treatment Research, of the American Phytopathological Society.

New Sweet Corn Hybrids for New York

New sweet corn hybrids included in trials at the New York State Agricultural Experiment Station are discussed in a recent article appearing in "Farm Research," supplementing hybrids previously described in Bulletin 686 published by the station a year or so ago. Among the yellow varieties are Hybrid 6664, Sagem, Mohawk, and Allegheny. White varieties include Silver Cross Bantam, G. McS., and Pontiac. Ear size, type, maturity, and yield of these new hybrids are compared in a table.

Reference: Farm Research, N. Y. State Agricultural Experiment Station, Geneva, Jan. 1, 1942. Copies available to members on request to the Raw Products Bureau.

Asparagus Rust Survey in New York State

A survey was made of a large number of New York State asparagus beds in an attempt to determine whether the rust so prevalent in 1940 and again in 1941 was a new type. It was evident that old plantings of Mary or Martha Washington remained healthy. More recent plantings, however, were affected in some cases. This evidence indicates that strains are being obtained which no longer are immune. This was true particularly of a special selection known as Paradise.

It was selected for yield and improved quality, and no doubt is an excellent asparagus where rust is not present. It is extremely susceptible, so that some plantings were destroyed completely. In addition, recent strains of Mary Washington grown near it were infected.

There is no satisfactory control for asparagus rust except that of planting resistant strains. All heavily infected plantings should be destroyed, and new resistant strains planted. The nurseryman or seedsman who sells the stock should be requested to make a statement regarding the resistance of the stock being sold. This will help the grower immediately, and at the same time impress the seedsman with the necessity of testing his asparagus again for immunity.

Reference: The Extension Pathologist, October, 1941. U. S. Department of Agriculture. "Asparagus Rust."

Effect of Maturity at Harvest on Sweet Corn Germination

Studies conducted by the Department of Agriculture on an experimental farm at Arlington, Va., of the effect of stage of maturity at time of harvest on the germination of sweet corn seed indicated that with material properly dried, an almost perfect germination of the grains of sweet corn was obtained with ears harvested long before the corn reached complete maturity. Results of the studies suggest that ears of sweet corn may be harvested at the time of maximum table quality, tests made upon part of the ear for desirable characteristics, and the remainder dried and preserved for subsequent planting. Selections of individual plants thus may be made at the time when the grains are at the proper edible stage rather than from the mature material.

With ears harvested very early the grains germinated better when allowed to dry on the cob than when removed from the cob before drying. If the ear was allowed to remain on the cut stalk during the drying process, germination was still better. Apparently at least small quantities of nutrients are derived from the cob and stalk after harvest if the drying is not too rapid. For the production of good seed artificial drying generally is necessary.

Reference: Journal of Agricultural Research, September 15, 1941. Copies available to members on request to the Raw Products Bureau.

Fertilizers for Utah Soils

A recent circular from the Utah Experiment Station introduces a discussion of the fertilizer needs of Utah soils by an explanation of the relation of fertilizer use to other crop production factors, and explains the role of the various elements required for plant growth. Nitrogen, phosphorus, and potassium problems of Utah soils are described in connection with fertilizer materials that supply these elements. Iron and boron deficiency, and gypsum and limestone fertilization are discussed, fertilizer labels are explained, and directions are included for calculating market values of fertilizers. Results of fertilizer trials in Utah with various crops and on different soil types are summarized.

Peas and tomatoes are listed among the crops likely to respond to soluble phosphate fertilizers.

Reference: Circ. 116, "Fertilizers for Utah Soils," Utah Agricultural Experiment Station, Logan.